

## ELECTRONIC INFORMATION DISCLOSURE STATEMENT

Electronic Version v18

Stylesheet Version v18.0

### Title of Invention

METHOD AND STRUCTURE FOR IMPROVING CMOS DEVICE  
RELIABILITY USING COMBINATIONS OF INSULATING  
MATERIALS

Application Number :

Confirmation Number:

First Named Applicant: Haining Yang

Attorney Docket Number: FIS920040194US1

Art Unit:

Examiner:

Search string: ( 5851893 or 6724053 ).pn

### US Patent Documents

Note: Applicant is not required to submit a paper copy of cited US Patent Documents

init	Cite.No.	Patent No.	Date	Patentee	Kind	Class	Subclass
JmJ	1	5851893	1998-12-22	Gardner et al.		438	305
JmJ	2	6724053	2004-04-20	Divakaruni et al		257	402

### Signature

Examiner Name	Date
T. M. Thomas	10-31-05

**INFORMATION DISCLOSURE CITATION**  
(Use several sheets if necessary)

NOV 01 2004

PATENT & TRADEMARK OFFICE

ATTY DOCKET NO.  
FIS920040194US1

APPLICATION NO.  
10/711,897

YANG ET AL.

FILING  
10-12-04

GROUP ART  
2822

**U.S. PATENT DOCUMENTS**

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE

**U.S. PATENT APPLICATION PUBLICATIONS**

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**FOREIGN PATENT DOCUMENTS**

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						YES	NO

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)**

JmJ	1	T. G. Gerence et al., "The Combined Effects of Deuterium Anneals and Deuterated Barrier-Nitride Processing on Hot-Electron Degradation in MOSFET's;" IEEE Transactions of Electron Devices, Vol. 46, No. 4, April 1999; pages 747 - 753.
JmJ	2	J. H Stathis; "Reliability limits for the gate insulator in CMOS technology;" IBM J. Res & Dev. Vol. 46 No. 2/3 March/May 2002; pages 265 - 286.

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1m1	3	T. H. Ning; "Why BiCMOS and SOI BiCMOS?;" IBM J. Res & Dev. Vol. 46 No. 2/3 March/May 2002; pages 181 - 186..

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Sheet 1 of 3

<b>FORM PTO 1449</b> (REV 2-32)	<b>U.S. DEPARTMENT OF COMMERCE</b> <b>PATENT AND TRADEMARK OFFICE</b>	File No. FIS920040194US1	Serial No. 10/711,897
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (Use several sheets if necessary)		Applicant(s): Haining Yang et al.	
		Filing Date: 10/12/2004	Group: 2811 2822

U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
JMJ	1	4,851,370	07/25/1989	Doklan et al.	437	225	12/28/1987
	2	5,506,169	04/09/1996	Guldi	437	70	10/20/1994
	3	5,538,916	07/23/1996	Kuroi et al.	437	72	04/20/1994
	4	5,580,815	12/03/1996	Hsu et al.	437	69	02/22/1994
	5	5,620,919	04/15/1997	Godinho et al.	438	230	03/30/1995
	6	5,633,552	05/27/1997	Lee et al.	310	311	07/10/1994
	7	5,668,403	09/16/1997	Kunikiyo	257	639	09/03/1996
	8	5,707,889	01/13/1998	Hsu et al.	437	69	05/13/1996
	9	5,891,798	04/06/1999	Doyle et al.	438	624	12/20/1996
	10	5,908,312	06/01/1999	Cheung et al.	438	287	05/28/1997
JMJ	11	5,985,737	11/16/1999	Wu	438	448	03/04/1998

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Examiner T. M. Thomas	Date considered 10-31-05
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JmJ	12	5,633,202	05/27/1997	Brigham et al.	438	763	06/06/1996
	13	5,847,463	12/08/1998	Trivedi et al.	257	751	08/22/1997
	14	6,040,619	03/21/2000	Wang et al.	257	649	09/25/1997
	15	6,046,494	04/04/2000	Brigham et al.	257	640	01/31/1997
	16	6,146,975	11/14/2000	Kuehne et al.	438	437	07/10/1998
	17	6,214,733 B1	04/10/2001	Sickmiller	438	691	11/17/1999
	18	6,228,777 B1	05/08/2001	Arafa et al.	438	740	06/08/1999
	19	6,261,924 B1	07/17/2001	Mandelman et al.	438	430	01/21/2000
	20	6,306,742 B1	10/23/2001	Doyle et al.	438	591	01/05/1999
JmJ	21	6,395,610 B1	05/28/2002	Roy et al.	438	354	06/20/2000

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	<b>Applicant(s):</b> Haining Yang et al.	
	<b>Filing Date:</b> 10/12/2004	<b>Group:</b> 281+ 2822

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
<i>TMJ</i>	22	6,436,848 B1	08/20/2002	Ramkumar	438	777	03/30/1999
	23	6,476,462 B2	11/05/2002	Shimizu et al.	257	627	12/07/2000
	24	6,509,230 B1	01/21/2003	Roy et al.	438	261	06/20/2000
	25	6,515,351 B2	02/04/2003	Arafa et al.	257	644	02/28/2001
	26	6,573,172 B1	06/03/2003	En et al.	438	626	09/16/2002
<i>TMJ</i>	27	6,825,529 B2	11/30/2004	Chidambarras et al.	257	336	12/12/2002

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Date considered

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Sheet 1 of 5

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HAINING YANG, ET AL.

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10-12-04Group:  
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	1	4,851,370	07/25/1989	Deklan et al.	437	225	12/28/1987
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	7	5,668,403	09/16/1997	Kumikiyo	257	639	09/03/1996
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	9	5,891,798	04/06/1999	Doyle et al.	438	624	12/20/1996
	10	5,908,312	06/01/1999	Cheung et al.	438	287	05/28/1997
	11	5,985,727	11/16/1999	Wu	438	448	03/04/1998

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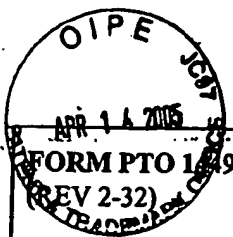

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	12	<del>5,633,202</del>	<del>05/27/1997</del>	<del>Brigham et al.</del>	<del>438</del>	<del>703</del>	<del>06/06/1996</del>
	13	<del>5,847,463</del>	<del>12/08/1998</del>	<del>Trivedi et al.</del>	<del>257</del>	<del>751</del>	<del>08/22/1997</del>
	14	<del>5,851,893</del>	<del>12/22/1998</del>	<del>Gardner et al.</del>	<del>438</del>	<del>305</del>	<del>07/18/1997</del>
	15	<del>6,040,619</del>	<del>03/21/2000</del>	<del>Wang et al.</del>	<del>257</del>	<del>649</del>	<del>09/25/1997</del>
	16	<del>6,046,494</del>	<del>04/04/2000</del>	<del>Brigham et al.</del>	<del>257</del>	<del>640</del>	<del>01/31/1997</del>
	17	<del>6,146,975</del>	<del>11/14/2000</del>	<del>Kuchma et al.</del>	<del>438</del>	<del>437</del>	<del>07/10/1998</del>
	18	<del>6,214,733 B1</del>	<del>04/10/2001</del>	<del>Sickmiller</del>	<del>438</del>	<del>691</del>	<del>11/17/1999</del>
	19	<del>6,228,777 B1</del>	<del>05/08/2001</del>	<del>Arafa et al.</del>	<del>438</del>	<del>740</del>	<del>06/08/1999</del>
	20	<del>6,261,924 B1</del>	<del>07/17/2001</del>	<del>Mandelman et al.</del>	<del>438</del>	<del>430</del>	<del>01/21/2000</del>
	21	<del>6,206,742 B1</del>	<del>10/23/2001</del>	<del>Doyle et al.</del>	<del>438</del>	<del>591</del>	<del>01/05/1999</del>
	22	<del>6,395,610 B1</del>	<del>05/28/2002</del>	<del>Roy et al.</del>	<del>438</del>	<del>354</del>	<del>06/20/2000</del>

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	24	<del>6,476,462 B2</del>	<del>11/05/2002</del>	<del>Shimizu et al.</del>	<del>257</del>	<del>627</del>	<del>12/07/2000</del>
	25	<del>6,509,230 B1</del>	<del>01/21/2003</del>	<del>Roy et al.</del>	<del>438</del>	<del>261</del>	<del>06/20/2000</del>
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	27	<del>6,573,172 B1</del>	<del>06/03/2003</del>	<del>En et al.</del>	<del>438</del>	<del>626</del>	<del>09/16/2003</del>
	28	<del>6,724,053 B1</del>	<del>04/20/2004</del>	<del>Divalaruni et al.</del>	<del>257</del>	<del>402</del>	<del>02/23/2000</del>
	29	<del>6,825,529 B2</del>	<del>11/30/2004</del>	<del>Chidambarrao et al.</del>	<del>257</del>	<del>336</del>	<del>12/12/2002</del>

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	2	T. G. Berence et al., "The Combined Effects of Deuterium Anneals and Deuterated Barrier-Nitride Processing on Hot-Electron Degradation in MOSFETs," IEEE Transactions of Electron Devices, Vol. 46, No. 4, April 1999, pages 747-753.

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3. H. Stathis, "Reliability limits for the gate insulator in CMOS technology," IBM J. Res. & Dev. Vol. 46 No. 2/3 March/May 2002, pages 265-286.

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